

efficiency of the gold traps. We are currently evaluating methods to improve analytical performance, including the attachment of a soda-lime trap to the sample line.

Mercury in Rainwater: Rainwater samples were collected on a weekly basis at Lake Waccamaw and Pettigrew State Parks in support of the national Mercury Deposition Network. Data on rainwater mercury concentrations and cumulative deposition rates are presented here to supplement atmospheric data (see table 4 and figures 8 & 9). Wet deposition rates are dependent on precipitation levels as well as mercury concentration in rainwater. Annual wet deposition rates in North Carolina are generally higher than rates in western and northern states but lower than areas such as south Florida. Annual volume-weighted mercury concentrations are comparable to other MDN network locations (Sweet).

Several intriguing patterns can be seen in the data from these two rural locations. As evidenced in table 4, both mercury concentration and wet deposition rates are consistently higher at Lake Waccamaw than Pettigrew State Park. It is conceivable that this pattern could be a result of local source influences. However the substantial variability in the week-to-week deposition totals and the composite sampling approach make it difficult to draw any meaningful conclusions on this relationship at this time. It will be interesting to note whether any consistent reductions in rainwater mercury concentration appear in the years ahead as local and regional sources reduce mercury use.

A seasonal pattern of rainwater mercury concentration appears when the data are separated into summer (April – September) and winter (October – March) months. The seasonal effect on rainwater mercury concentration has been described elsewhere (Sweet, Mason). While snow is believed to be less efficient at scavenging particles from the atmosphere, little or no frozen precipitation would be expected at these sites, even during winter months. Other potential reasons for seasonal variability could include a temperature effect on atmospheric or cloud-water reactions or seasonal shifts in air mass movement.

## CONCLUSIONS

Historical results from long-term ambient air monitoring at Lake Waccamaw State Park suggest the possibility of regional source impacts on TGM levels. Recent improvements occurred coincident with a substantial reduction in mercury use at a chlor-alkali facility located approximately 25 kilometers to the east-northeast. At monitoring stations located within a mile of the former mercury-cell operation, fluctuations in TGM continue to be seen although with diminishing magnitude and frequency. A clear relationship between atmospheric TGM and RGM in this area has not yet been established. Methods to continuously monitor atmospheric RGM have encountered complications that may be resolved by making minor sampling modifications. Composite rainwater sampling and analysis suggests that wet deposition rates in eastern North Carolina are comparable to other areas along the east coast of the United States. Annual cumulative wet deposition and rainwater mercury concentration are slightly, but consistently, higher at Lake Waccamaw than at Pettigrew State Park.